

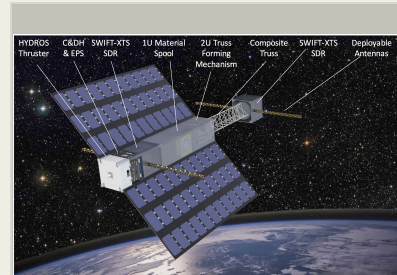
MakerSat, Phase I

Completed Technology Project (2017 - 2017)



Project Introduction

Small satellite platforms such as CubeSats and nanosats are providing opportunities for NASA, DoD, and commercial ventures to perform missions at lower cost and improved return-on-investment. There is a growing desire to enable SmallSats to perform "Long Baseline" and "Spatially Diverse" observation, measurement and collection missions. Traditionally, these types of missions would be performed using formation flying or using large, costly satellites equipped with complex deployable structures. For many sensing modalities, fundamental physics demands large apertures or long baselines to achieve the high resolution, sensitivity, and throughput required for these missions. Reliance upon fixed and deployable aperture/mast technologies prevents small satellites from matching traditional large satellite platforms in terms of performance. The proposed "MakerSat Demonstration Mission" effort will develop a third alternative that will enable small satellite platforms to perform this class of missions: "Constructable" technologies, that use in-space manufacturing technologies to enable SmallSats to "grow" significantly larger structures. A SmallSat that, once on orbit, can increase its size from one to two orders of magnitude provides a transformative option to formation flying or deployable structures. "MakerSat" is a low-cost system intended to validate the Constructable SmallSat platform and enable nanosat-class systems to perform missions such as single-pass interferometric SAR, long-baseline radio astronomy, and infrared astronomy. During the Phase I effort, TUI will develop the Requirements, ConOps and Architecture for the demonstration mission. During the Phase II effort, TUI will develop an EM unit suitable for demonstration and testing Trusselator mission technology. During the Phase III effort, TUI will integrate a FM version of the Trusselator demonstration technology into an appropriately sized SmallSat Bus and fly the MakerSat Demonstration Mission.



MakerSat, Phase I Briefing Chart Image

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Tethers Unlimited Inc

Responsible Program:

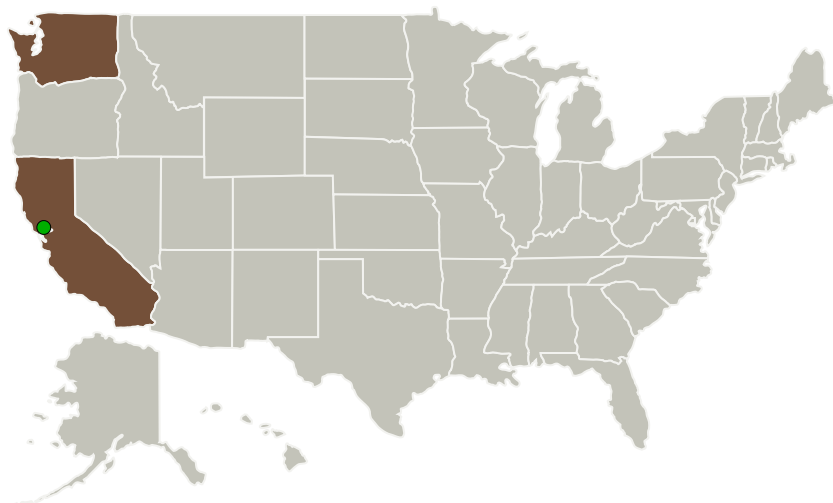
Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Tethers Unlimited Inc	Lead Organization	Industry	
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California	Washington
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

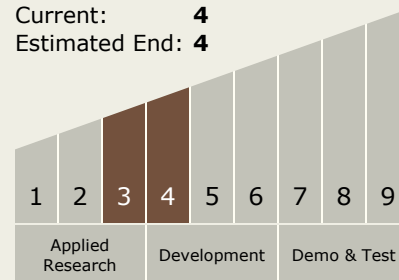
Blaine A Levedahl

Technology Maturity (TRL)

Start: 3

Current: 4

Estimated End: 4



Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.2 Structures
 - └ TX12.2.5 Innovative, Multifunctional Concepts

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Images



Briefing Chart Image

MakerSat, Phase I Briefing Chart Image

(<https://techport.nasa.gov/image/126291>)